

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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VENUE : _____

SEAT NO : _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

TCP 1311 – OBJECT ORIENTED PROGRAMMING

(All sections / Groups)

30 MAY 2019
9.00 am - 11.00 am
(2 Hours)

Question	Marks
1	
2	
3	
4	
Total	

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 9 pages with 4 Questions only.
2. Attempt All Questions. The distribution of the marks for each question is given.
3. Write all your answers in this Question paper.

Question 1

Given the following problem description.

A class named Person and its two subclasses named Student and Employee. Faculty and Staff are subclasses of Employee. A person has a name, address, phone number, and email address. A student has a level (foundation, diploma, degree). The level is defined as an integer constant. An employee has an office room number, salary, and date hired. A date class named MyDate contains the attributes year, month, and day. A faculty member has a title and a position. A staff member has office hours. Override the `toString` method in each class to display the class name and the person's name.

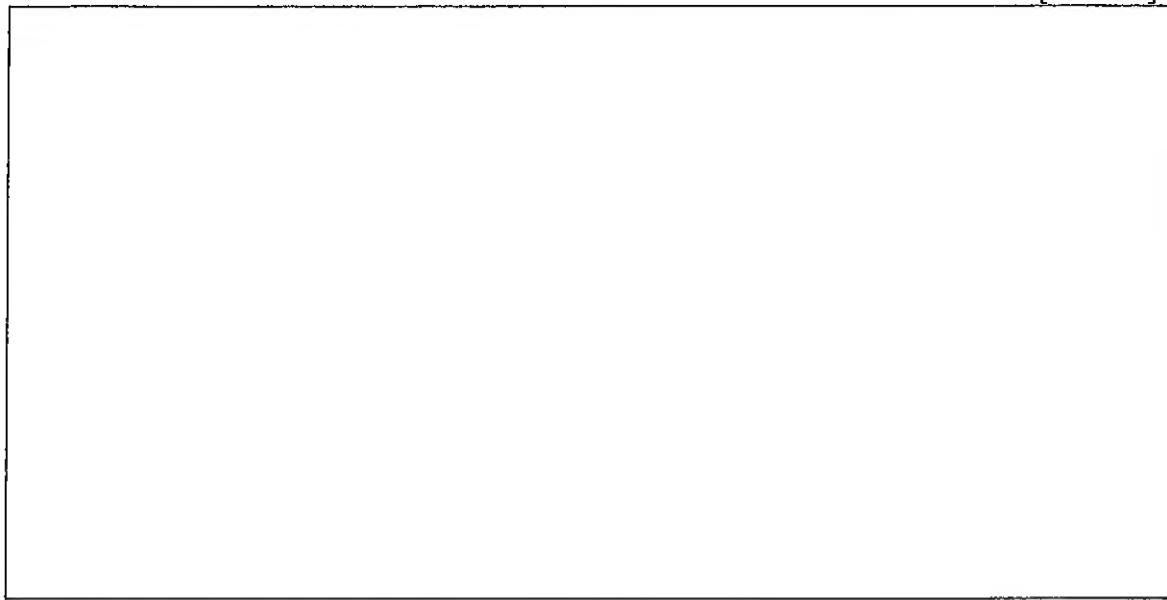
(a) Draw the UML diagram for the classes with their relationships but without their attributes and methods.

[4 marks]

Continued

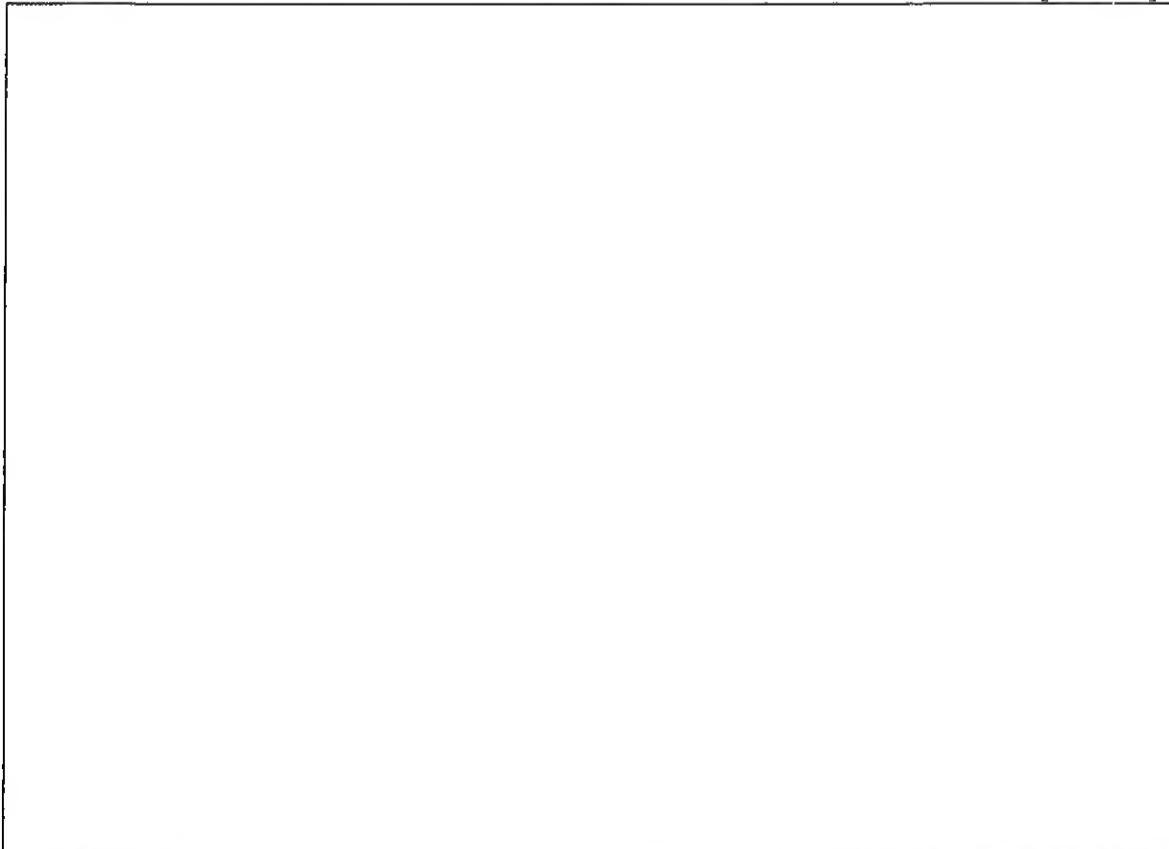
(b) Draw the class diagram for the Student class only with their attributes and methods.

[3 marks]



(c) Write the code for the Student class only.

[3 marks]



Continued

Question 2

(a) What are the four pillars of object oriented programming?

[2 marks]

(b) What are the two differences between constructor and method?

[2 marks]

(c) Analyze the following code.

[2 marks]

```
public class App {  
    public int t = 1;  
    public static void main(String[] args) {  
        int x;  
        System.out.println(t);  
    }  
}
```

Does the program compile and run fine? Justify your answer.

Continued

(d) Specify the line number and correct the problem in the following code segment.

[2 marks]

```
01  public class Circle {  
02      private double radius;  
03      public Circle(double radius) {  
04          radius = radius;  
05      }  
06  }
```

(e) Show the output of the following program.

[2 marks]

```
public class Program {  
    public static void main(String[] args) {  
        Count count = new Count();  
        int times = 0;  
        for (int i = 0; i < 100; i++) {  
            increment(count, times);  
        }  
        System.out.println(count.counter);  
        System.out.println(times);  
    }  
    public static void increment(Count c, int times) {  
        c.counter++;  
        times++;  
    }  
}  
class Count {  
    public int counter = 1;  
}
```

Continued

Question 3

(a) What is multiple inheritance? Does Java support multiple inheritance using the keyword extends?

[2 marks]

(b) Specify the line number and correct the problem in the following code segment.

[2 marks]

```
01 public class A {  
02     private double property;  
03     public A(double p) {  
04         property = p;  
05     }  
06 }  
07 class B extends A {  
08     private double attribute;  
09     B(double p, double a) {  
10         A(p);  
11         attribute = a;  
12     }  
13 }
```

Continued

(c) Specify the line number that shows polymorphism concept in the following program.
Based on the following program, explain what polymorphism is.

[2 marks]

```
01 class A {  
02     public void method() {  
03         System.out.println("A");  
04     }  
05 }  
06 class B extends A {  
07     public void method() {  
08         System.out.println("B");  
09     }  
10 }  
11 class App {  
12     public static void main(String[] args) {  
13         A a = new B();  
14         a.method();  
15     }  
16 }
```

(d) Specify the line numbers and explain the problems arise in the following code segment. For your hint, there are two problems in the following code segment.

[4 marks]

```
01 interface A {  
02     void print() { }  
03 }  
04 abstract interface B {  
05     abstract void method() { }  
06 }
```

Continued

Question 4

(a) Complete the method below to compute the following series:

$m(k) = 1/3 + 2/5 + 3/7 + \dots + k/(2k+1)$ where $k \geq 1$.

[2 marks]

```
public static double m(int k) {
```

```
}
```

(b) State whether each of the following is true or false. If false, explain why.

[4 marks]

- i. The first two arguments of Graphics method drawOval specify the center coordinate of the oval.
- ii. In the Java coordinate system, x-coordinates increase from left to right and y-coordinates from top to bottom.
- iii. Graphics method drawArc allows negative angles.

i.

ii.

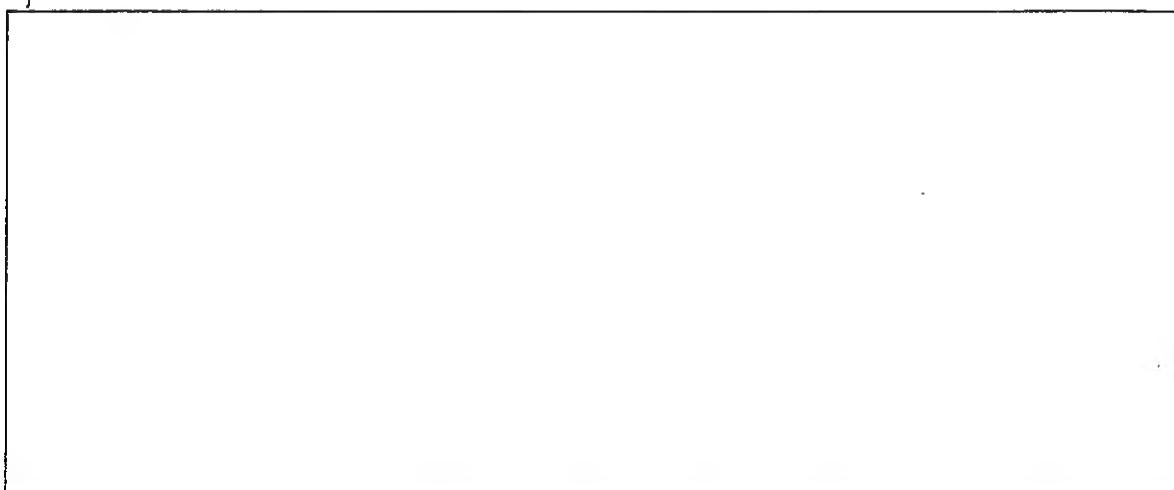
iii.

Continued

(c) Draw GUI application output of the following Java code.

[4 marks]

```
public class DollarToRinggit extends JFrame {  
    private final JTextField tfUSDollars = new JTextField();  
    private final JTextField tfMYDollars = new JTextField();  
    private final JButton btnConvert = new JButton("Convert");  
    public static void main(String[] args) {  
        DollarToRinggit dollarToRinggit = new DollarToRinggit();  
    }  
    public DollarToRinggit() {  
        super("Convert US Dollars to MY Dollars");  
  
        JPanel p1 = new JPanel(new GridLayout(2, 1));  
        p1.add(new JLabel("US Dollars"));  
        p1.add(new JLabel("Malaysian Dollars"));  
  
        JPanel p2 = new JPanel(new GridLayout(2, 1));  
        p2.add(tfUSDollars);  
        p2.add(tfMYDollars);  
  
        JPanel p3 = new JPanel(new BorderLayout());  
        p3.add(p1, BorderLayout.LINE_START);  
        p3.add(p2, BorderLayout.CENTER);  
  
        JPanel p4 = new JPanel(new FlowLayout(FlowLayout.RIGHT));  
        p4.add(btnConvert);  
  
        add(p3, BorderLayout.CENTER);  
        add(p4, BorderLayout.PAGE_END);  
  
        tfUSDollars.setHorizontalAlignment(JTextField.RIGHT);  
        tfMYDollars.setHorizontalAlignment(JTextField.RIGHT);  
        tfMYDollars.setEditable(false);  
  
        setSize(400, 150);  
        setVisible(true);  
    }  
}
```



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